

# SAC Command Reference Manual

[SAC Users Guide](#) Commands: [A - Z](#) [Functional](#) Subprocesses: [SPE](#) [SSS](#) [SAC/IRIS](#)

## INTERPOLATE

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### SUMMARY

Interpolates evenly spaced data to a new sampling rate. Interpolate can also be used with unevenly spaced data.

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### SYNTAX

```
INTERPOLATE {DELTA v} {NPTS n} {BEGIN v}
```

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### INPUT

- DELTA v:** Set new sampling rate to v. The time range (e-b) is not changed, so NPTS is changed. You cannot use both DELTA and NPTS in the same call.
- NPTS n:** Force the number of points in interpolated file to be n. The time range (e-b) is not changed, so DELTA is changed. You cannot use both NPTS and DELTA in the same call.
- BEGIN v:** Start interpolation at v. This value becomes the begin time of the interpolated file. BEGIN must be used with either DELTA or NPTS.

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### DEFAULT VALUES

The time series is unchanged.

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### DESCRIPTION

This command uses the Wiggins' weighted average slopes interpolation method (1976, BSSA, 66, p. 2077) to convert unevenly spaced data to evenly spaced data but which works quite well at resampling evenly spaced data to a different sampling rate. Unlike cubic-spline interpolation, there is no extrema between input sample points. If the sample rate is decreased, there is no antialiasing, so for downsampling, [DECIMATE](#) may be a better option. The end time (e) is not changed. An alternative to using BEGIN is to [CUT](#) the time series to the desired b and e before calling INTERPOLATE. If DELTA and NPTS are in the same call to INTERPOLATE, the last one in the command sequence will be used.

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### EXAMPLES

Assume that FILEA is an evenly spaced data file with a sampling interval of 0.025. To convert it to a sampling rate of 0.02 seconds:

```
SAC> READ FILEA
SAC> INTERPOLATE DELTA 0.02
```

Assume that FILEB has NPTS=3101 and one wants to have it sample the same time range but with NPS=4096 points (a power of 2):

```
SAC> READ FILEB
SAC> INTERPOLATE NPTS 4096
```

If one tries to change DELTA and NPTS in the same call, only the second call will be used. Hence if the previous call were replaced by:

```
SAC> READ FILEB
SAC> INTERPOLATE NPTS 4096 DELTA 0.02
```

DELTA would be changed to 0.02 and NPTS would be calculated from the new DELTA and the input B and E. If the order were reversed:

```
SAC> READ FILEB
SAC> INTERPOLATE DELTA 0.02 NPTS 4096
```

the output file would have NPTS=4096 and DELTA would be calculated.

Assume that FILEC is an unevenly spaced data file. To convert it to an evenly spaced file with a sampling interval of 0.01 seconds:

```
SAC> READ FILEC
SAC> INTERPOLATE DELTA 0.01
```

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## WARNING MESSAGES

- 2008: Requested begin time is less than file's begin time. Output truncated.

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## HEADER CHANGES

DELTA, NPTS, E, B (if FIRST invoked), LEVEN (if initially unevenly spaced.)

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## LATEST REVISION

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